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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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David Strand

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EXAMINER

ALLEN, CAMERON J

ART UNIT

PAPER NUMBER

1797

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DELIVERY MODE

06/11/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/516,599	Applicant(s) STRAND ET AL.	
	Examiner CAMERON J. ALLEN	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28,38,39,43,56-72, 85 and 86 is/are pending in the application.
- 4a) Of the above claim(s) 1-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 38,39,43,56-72 and 86 is/are rejected.
- 7) ☒ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/21/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election of Group II claims 38, 39, 43, 56-72, and 85 in the reply filed on 3/9/2009 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 70 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear to the Examiner what unit of measure “:m” represents. Therefore the claim is unclear.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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Claim 38 is rejected under 35 U.S.C. 102(b) as being anticipated by Laurell WO 02072234.

Regarding claim 38, discloses a fluid-handling device for ultrasonic manipulation of fluid-borne particles, comprising, in combination: (Figure 4a)
a fluid-handling manifold having a fluid inlet port and defining a fluid-handling void comprising at least a first fluid channel; (1710) and
an ultrasonic particle manipulator defining an ultrasonic cavity and comprising at least one ultrasonic transducer(1726 and 1716), the first fluid channel extending from the inlet port to the ultrasonic cavity and the ultrasonic particle manipulator being operative to establish an ultrasonic standing wave field in particle- bearing fluid in the first fluid channel at the ultrasonic cavity. (Figure 4a)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

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3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 39, 43, 56-59, 61, 62, 69, and 71-72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laurell WO 02072234 in further view of Zumeris WO03020027.

Regarding claims 39, 43, 56, Laurell discloses the fluid-handling device of claim 38, but does not disclose wherein the ultrasonic cavity has a non uniform shape. The Zumeris reference discloses, wherein the ultrasonic cavity has a non-uniform configuration, either in the direction of flow or traverse to the flow. (Figure 19a-19c) It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Laurell reference with the chamber shape of the Zumeris reference, since using the known device in a known configuration would provide the expected result of providing a cavity capable of fluid handling

Regarding claim 57, Laurell in view of Zumeris discloses the fluid-handling device

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of claim 56 for ultrasonic manipulation of fluid-borne particles, wherein:

the fluid-handling void further comprises a second fluid channel (Laurell 1720) in fluid communication with the first fluid channel (1710) at an intersection within the ultrasonic cavity; (1712) the ultrasonic transducer is operative to establish ultrasonic standing wave fields having an axial direction of standing wave propagation substantially perpendicular to the direction of fluid communication through the intersection; (1716 and 1726)

the Zumeris reference discloses the cross-sectional configuration of the ultrasonic cavity is non-uniform in the direction of fluid communication through the intersection; and the ultrasonic particle manipulator is operative to collect fluid-borne particles from fluid in the first fluid channel and move collected fluid-borne particles through the intersection to the second fluid channel by varying the actuation frequency of the ultrasonic transducer. (Figure 26a-c)

Regarding claim 58, Laurell in view of Zumeris discloses the fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein the ultrasonic particle manipulator is operative to selectively position an ultrasonic standing wave field in the second fluid channel. (Laurell 1726)

Regarding claim 59, Laurell in view of Zumeris discloses the fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein the ultrasonic particle manipulator is operative to selectively position an ultrasonic standing wave field in the intersection of the first and second fluid channels. (Laurell 1716)

Regarding claims 61 and 62, Laurell in view of Zumeris discloses the fluid-

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handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein the dimension of the ultrasonic cavity in the axial direction of standing wave propagation increases continuously along the direction of fluid communication through the intersection (Zumeris 19a-c) and varies wave-like along the direction of fluid communication through the intersection.(24a-24b)

Regarding claim 64, Laurell in view of Zumeris discloses the fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein a surface of the ultrasonic cavity is formed by the ultrasonic transducer and has a sloping configuration along the direction of fluid communication through the intersection. (Zumeris figure 9a and 19a)

Regarding claim 65, Laurell in view of Zumeris discloses the fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein a surface of the ultrasonic cavity is formed by the ultrasonic transducer and has a wave like configuration along the direction of fluid communication through the intersection. (24A and B)

Regarding claim 69, Laurell in view of Zumeris discloses the fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein the first fluid flow channel and the second fluid flow channel extend substantially parallel each other on opposite sides of a dividing wall between them, and the intersection comprises a passageway through the dividing wall. (Zumeris figure 25a)

Regarding claims 71 and 72, Laurell in view of Zumeris discloses the fluid-

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handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein the first fluid flow channel and the second fluid flow channel intersect each other substantially tangentially. (Zumeris Figure 26—c) There is also an orifice or opening at section 1710 figure 4a in the Laurell reference.

Claims 67 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laurell WO 02072234 in view of Zumeris US 7,431,892 B2 in further view of Yasuda US 6,216,538.

Regarding claims 60 and 63, Laurell in view of Zumeris discloses the fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, but does not disclose wherein the dimension of the ultrasonic cavity in the axial direction of standing wave propagation increases stepwise along the direction of fluid communication through the intersection. The Yasuda reference does disclose wherein the dimension of the ultrasonic cavity in the axial direction of standing wave propagation increases stepwise. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Laurell in view of Zumeris reference by using the stepwise configuration in the Yasuda reference, since Yasuda disclose it would yield the added benefit and expected result of trapping particles. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Zumeris transducer configuration with the step configuration of the Yasuda reference, since the configuration would yield the expected result of particle separation. (Column 5 4-6 and col. 23 lines 9-13)

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Regarding claim 66, Laurell in view of Zumeris discloses the fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein a surface of the ultrasonic cavity is formed by an ultrasonic reflector and has a stepwise configuration along the direction of fluid communication through the intersection. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Zumeris transducer configuration with the step configuration of the Yasuda reference, since the configuration would yield the expected result of particle separation. (Column 5 4-6 and col. 23 lines 9-13)

Claims 67 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laurell WO 02072234 in view of Zumeris US 7,431,892 B2 in further view of Cefai GB 2339703.

Regarding claim 67, Laurell in view of Zumeris discloses the fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, but does not disclose wherein a surface of the ultrasonic cavity is formed by an ultrasonic reflector and has a sloping configuration along the direction of fluid communication through the intersection. The Cefai reference does disclose the use of a reflector. (Abstract) It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Laurell in view of Zumeris by using the reflector in place of one of the transducers in figures 19a-c, since it would yield the expected result of creating a standing wave field. (Abstract)

Regarding claim 68, Laurell in view of Zumeris discloses the fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein a surface has a

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wave like configuration of the ultrasonic cavity but is not formed by the ultrasonic reflector and along the direction of fluid communication through the intersection. The Cefai reference does disclose the use of a reflector. (Abstract) It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Laurell in view of Zumeris by using the reflector in place of one of the transducers in figures 19a-c, since it would yield the expected result of creating a standing wave field. (Abstract)

Claims 85 and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zumeris US 7,431,892 B2 in further view of Cefai GB 2339703.

Regarding claims 85 and 86, the Zumeris reference discloses an omni-directional fluid-handling device for ultrasonic manipulation of fluid-borne particles, comprising, in combination: a fluid-handling manifold having a fluid inlet port and defining a fluid-handling void comprising at least a first fluid channel in fluid communication with the fluid inlet port; and a particle manipulator capable of being an omni-directional ultrasonic comprising at least one ultrasonic transducer but does not disclose an acoustic reflector positioned opposite the ultrasonic transducer, the ultrasonic transducer and the acoustic reflector cooperatively defining between them an ultrasonic cavity and operative in any orientation relative to gravity to separate fluid-borne particles from fluid flowed through the ultrasonic cavity by establishing an ultrasonic standing wave field in a portion of the first fluid channel extending through the ultrasonic cavity, wherein the spacing between the ultrasonic transducer and the acoustic reflector is not more than 300 microns. The

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Cefai reference does disclose the use of a transducer (10), reflector (12) spaced apart (defining the fluid channel) 300 microns or less to establish a standing wave capable of manipulating particles. (Abstract) It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Zumeris reference by using the reflector in the Cefai reference, since it would yield the expected result of creating a standing wave field. (Abstract)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAMERON J. ALLEN whose telephone number is (571)270-3164. The examiner can normally be reached on M-Th 9-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CJA

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797